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Notice of Allowability	Application No.	Applicant(s)	
	10/729,525	SHEA, JOHN J.	
	Examiner	Art Unit	
	Scott Bauer	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application submitted 12/05/2003.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>12/5/03</u> 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____. |
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DETAILED ACTION

Reasons for Allowance

1. Claims 1-20 are allowed.
2. The following is an examiner's statement of reasons for allowance:
3. The Allowable subject matter of Claim 1 is directed to an apparatus for detecting an arcing fault at a component of an electrical power system. Claim 1 is allowable because the related prior art does not teach or fairly suggest an apparatus for detecting an arcing fault at a component of an electric power system, with the arcing fault generating light at a first predetermined wavelength in the presence of light at a second wavelength from another source which may include the first predetermined wavelength, the second wavelength being different from the first predetermined wavelength, the apparatus comprising: a light source providing modulated light at the second wavelength and at a first frequency; an optical fiber including a first end, a gathering portion and a second end, the first end of the optical fiber receiving the modulated light from the light source, the gathering portion being proximate the component and receiving gathered light including some of the light at a first predetermined wavelength and some of the light at a second wavelength from another source, the second end of the optical fiber including the modulated light and the gathered light; a splitter receiving the modulated light and the gathered light from the second end of the optical fiber and

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splitting the modulated light and the gathered light into a first light beam and a second light beam; a first filter extracting from the first light beam a first filtered light beam including a first wavelength bandwidth having the first predetermined wavelength; a first detector generating a first sensed light electrical signal from the first filtered light beam; a second filter extracting from the second light beam a second filtered light beam including a second wavelength bandwidth not having the first predetermined wavelength; a second detector generating a second sensed light electrical signal from the second filtered light beam; a third filter extracting from the second sensed light electrical signal a third electrical signal representative of some of the light at a second wavelength from another source and not including the modulated light; and means for generating an arcing signal in response to a predetermined relationship between the first sensed light electrical signal and said third electrical signal.

4. With regard to Claim 1, Shea (US 6,229,680) discloses an apparatus and method for optically detecting arcing faults in electric power systems in the presence of other light sources. Shea teaches that the apparatus comprises; an optical fiber (5) including a first end(7), a gathering portion (9), and a second end (11); a splitter (13), receiving the gathered light from the second end (11) of the optical fiber (5) and splitting the beam into a first light beam (17₁) and second light beam (17₂), a first optical filter (19) to extract a wavelength indicative of an arc fault from the first light beam; a second optical filter (21) to extract a second wavelength indicative of ambient light; photodiodes (27), to act as a first and second detector , generating a first and second sensed light sensed

light signals from the first and second filtered light beams (17); and electronics (29) for generating an arcing signal in response to a predetermined relationship between the first and second sensed light electrical signal.

Shea does not teach that a light source provides modulated light at a second wavelength and first frequency, different from that produced by an arc fault, at one end of an optical gathering means. Nor does Shea teach that a third filter extracts from the second sensed light electrical signal, at the wavelength of the modulated light, light from another source not including the modulated light.

5. Buchmüller et al. (US 4702553) discloses a fiber-optical sensor for detecting electric arc-discharges comprising an optical waveguide (20) to detect light (5) given off by an arc fault (4) in a high speed switching network. The waveguide is provided with a light source at one end. An optical filter (10) is provided at the other end of the waveguide to split the light gathered by the waveguide. A wavelength (5) indicative of an arc fault, is sent to a first light detector (11) and a second wavelength of the light source (3.2) is sent to a second light detector. The two signals are amplified and sent to an evaluator signal to detect the time shift between the two signals.

Buchmüller et al. does not disclose that the gathering portion of the optical fiber (20) gathers light including light of a second wavelength from another source that isn't an arc fault. Buchmüller et al. further does not teach that a third filter extracts from the second sensed light electrical signal, at the wavelength of the modulated light, light from another source not including the modulated light.

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6. Phillips (US 6433976) discloses an instantaneous arc fault light detector with resistance to false tripping for detecting an arc fault in electrical switchgear. The detector comprises a light detector, which generates a light detector signal in response to the amount of light detected. A differentiator circuit receives the light detector signal and differentiates the light detector signal over time to generate a differentiated light detector signal. A comparator circuit then compares the differentiated light detector signal to a reference signal and generates an output signal when the differentiated light detector signal exceeds the reference value (column 1 lines 40-50).

Phillips does not disclose the use of a light source to generate modulated light at a second wavelength different from a first wavelength, generated by an arc fault. Phillips further does not teach that a third filter extracts from the second sensed light electrical signal, at the wavelength of the modulated light, light from another source not including the modulated light.

7. Claims 2-9 are allowable as they depend on Claim 1, which is also allowable.

8. Claim 10 is allowable as it only differs from Claim 1 in that it describes the method of using the apparatus of Claim 1.

9. Claims 11-14 are allowable in that they depend from Claim 10, which is also allowable.

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10. Claim 15 is allowable as it only differs from Claim 1 in that it describes an apparatus that protects a bus system from an arc fault by disconnecting the power from the load after a fault is detected. Claim 1 teaches an apparatus to only detect an arc fault.

11. Claims 16-20 are allowable as they depend on Claim 15 which is also allowable.

12. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Bauer whose telephone number is 571-272-5986. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER